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EUSARSIELLA DONABBOTTI, NEW OSTRACODE SPECIES (SARSIELLIDAE) FROM THE BELIZE BARRIER REEF

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ABSTRACT

Eusarsiella donabboti, a new species of ostracode (Myodocopida, Sarsiellidae) from the Belize barrier reef in the vicinity of Carrie Bow Cay is described.

MATERIAL AND METHODS

Specimens were collected from a variety of habitats in the vicinity of Carrie Bow Cay (16°48'N, 88°05'W). Collecting methods and localities are also described in Cohen (1989). Holotype and paratypes are deposited in the Los Angeles County Museum of Natural History (LACM). Additional paratypes are deposited in the United States National Museum of Natural History (USNM), and Australian Museum (Sydney, Australia). All materials are in alcohol except for additional limb slides and SEM dry mounts as listed under type material.

DESCRIPTION OF *EUSARSIELLA DONABBOTTI*

Sarsiellidae Brady and Norman, 1896
Sarsiellinae
Eusarsiella Cohen and Kornicker, 1975
Eusarsiella donabbotti new species
Figures 1–7

Holotype.—LACM 81-105.1, ovig. female, greatest L 1.25 mm, partially dissected, in alcohol. Specimen A of sample ac-cbc-610C: sand and rubble zone in Lagoon near fixed transect about 200 m NE of Carrie Bow Cay, Belize; Cohen net bumping bottom of rather silty *Halimeda* sand with few live and dead *Acropora cervicornis,* some blue-green algae, depth about 1.5 m; 14 June 1981.

Paratypes.—[All collected by A. Cohen with hand net bumping surface of bottom] LAGOON, Thalassia next to patch reef about 300 m and 214° SW of Carrie Bow Cay, 10 m depth, 14 May 1976, ac-cbc-20A: 1 male (limb slide, SEM mount), LACM 76-573.1. LAGOON, sand and rubble zone, same location as type-locality: ac-cbc-375IV, 20 June 1979: 1 ovig. female, LACM 79-184.1; ac-cbc-527II, 3 November 1979: 1 ovig. female, LACM 79-185.1; ac-cbc-610B, 14 June 1981: 2 ovig. female, 1 female, Australian Museum. SOUTH WATER CUT, N side of channel, about 0.5 km and 330° NW from Carrie Bow Cay: ac-cbc-105-B, next to channel, *Thalassia* with patches of coral heads and gorgonians, 3 m depth, 20 April 1977: 1 male, LACM 77-176.1; channel bottom, *Halimeda* sand, 10 m depth, 21 April 1977, ac-cbc-111: A, 1 ovig. female (limb slide, SEM mount), B, 1 male, LACM 77-177.1. OUTER FORE-REEF, sand trough, near fixed transect about 500 m NE of Carrie Bow Cay: ac-cbc-602: inner side of trough, about 18 m depth, *Halimeda* sand, 9 June 1981: 602A, 1 female, valves of 1 female and 1 male; ac-cbc-602-F: 1 male (SEM mount), 602-G: 1 female (SEM mount), 602-H: 1 ovig. female, 602-K: 2 males, LACM 81-106.1; ac-cbc-514III, outer side of trough, about 25 m depth, 29 October 1979: 1 ovig. female, LACM 79-110.1; ac-cbc-604, near ac-cbc-602, but finer sediment, 11 June 1981: 604A: 1 ovig. female, 3 females, 604C-D: 2 ovig. females, 1 female, LACM 81-107.1; 604B: 3 ovig. females, 1 female, 1 male, USNM 193747.

Diagnosis.—Valve: Long, narrow (female) or large triangular (male) caudal process with rounded point, male with rostrum not overhanging incisur. Surface covered with fossae; numerous spines or papillae and transparent material particularly on ribs, knob-like processes and margin; female with two curved ventral ribs (male with four horizontal ribs) and two to three short anterior horizontal ribs connected to anterior margin. Dorsal-most ventral rib stronger, and with six rounded knobs parallel to ventral and posterior margins, these two ribs sometimes joined ante-

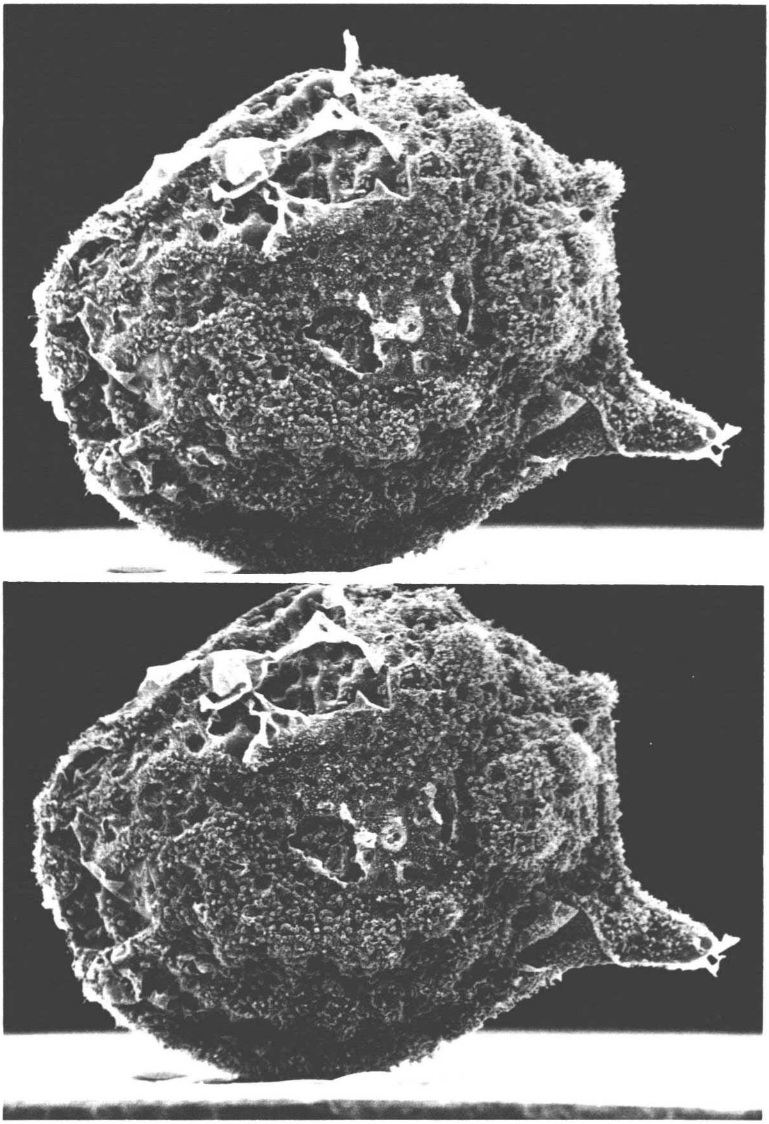

Figure 1. *Eusarsiella donabbotti*. Adult female, (ac-cbc-602-G), L 1.35 mm, left valve, external views: Whole valve, stereo pair, ×75.

riorly. Ventral-most rib low, parallel to anterior and ventral margins. Less conspicuous spinous riblets at right angles to ventral margin. Center posterodorsal area of valve very spinous (fossae with at least four rows of spines between them) and with large knob; posterodorsal corner of valve with two knobs connected to low spinous rib; small rounded knob on caudal process; unrippled anterior and ventral margins with wide fringe of papillae (connected with transparent material) and rather short tapered bristles (only slightly longer than fringe of papillae). Size: Greatest length female, 1.23–1.35 mm (mean = 1.27 ± 0.04, N = 11), male, 1.01 ± 1.05 mm (mean = 1.04 ± 0.04, N = 7), male height, 0.68–0.72 (mean = 0.70

± 0.02, N = 5). Caudal infold: Three to five long tapered bristles in irregular row. Second antenna: Endopod 1-jointed with two proximal bristles, male with bare terminal mound (may be second joint); exopod joints two to eight in female and two to six in male with bristles with both hairs and stout proximal spines; ninth joint with one longer bristle with hairs and stout proximal spines and one spinous bristle (apparently bare in male). Mandible: Ventral claw of female second endopodial joint 0.75 length of terminal claw; ventral bristle of second endopodial joint of male much longer than terminal (and only) bent claw, claw L about = L of second endopodial joint. Fourth limb: Exopod with two unequal bristles; female with middle end claw half length of longest adjacent claw. Fifth limb: Nine bristles on fused exopodial joints. Sixth limb: Gap between posterior and ventral bristles less than or equal to width of one ventral bristle in female. Seventh limb: Females with one to two distal and six terminal bristles, males with no distal and three to five terminal bristles.

Description of Adult Female.—[Most information in diagnosis not repeated.]

CARAPACE (Figs. 1, 2A). Knob-like projections (Figs. 1, 3A, C, D) bearing numerous long papillae or spines with microscopically enlarged rounded tips united with transparent coating; posterior knobs larger (one large knob at posterodorsal end of outer rib, large knobs (one dorsal, two ventral) at each posterior end of inner rib), one similar knob on caudal process, posterodorsal margin with two large knobs projecting beyond posterodorsal corner. Surface of fossae appearing smooth, surface between fossae with short pointed spines or papillae.

INFOLD. Anterior infold and posteroventral infold each with one minute bristle. Caudal infold (Figs. 2B, 4E, F) with irregular row of three to five long tapered bristles emerging from pores and one long ventral bristle on inner edge anterior to row. Posterior infold with two long setose bristles.

SELVAGE. Normal for genus.

FIRST ANTENNA. Second joint with one long dorsal bristle with few long proximal hairs and short distal spines. Third joint with one long spinous dorsal and one medium-length spinous ventral bristle. Fourth joint with one long spinous dorsal and two unequally long spinous ventral bristles. Sensory bristle of fifth joint with one filament and narrowed tip. Spinous bristle of sixth joint about 0.33 length of a-bristle. Seventh joint: Bare b-bristle slightly shorter than a-bristle and with narrowed tip, long c-bristle with short filament. Eighth joint: d- and e-bristles long, filamentous; long f-bristle with one short filament and long g-bristle with three short filaments, both with narrowed tips.

SECOND ANTENNA. Endopod: Two proximal bristles. Exopod: first joint with minute terminal process; bristle of second joint with 17 spines.

MANDIBLE (Fig. 2C). Coxa with stout ventral hairs; endite minute, pointed, unringed. Basis: One minute distal ventral lateral bristle; three to four ventral medial bristles (proximal group of two short bristles and possibly one minute spine (difficult to determine), plus one distal minute unringed bristle); three minute dorsal spines (one minute distal, one minute and one very minute subterminal). Exopod: Minute. Endopod: First joint with ventral claw about 0.75 length of claw on second and 0.33 length of claw on third joint; with minute distal dorsal spines. Second joint with ventral claw and short terminal dorsal spine. Third joint with long terminal claw with rounded point; minute dorsal spine and one ventral medial short unringed bristle.

FOURTH LIMB (Fig. 2D). Basis with one lateral bristle near exopod. Exopod with two unequal bristles. Endite bristles: I = 7 (1 pectinate); II = 3 (2 pectinate); III = 6 (2 pectinate). Endopod: First joint with distally ringed and pectinate alpha-

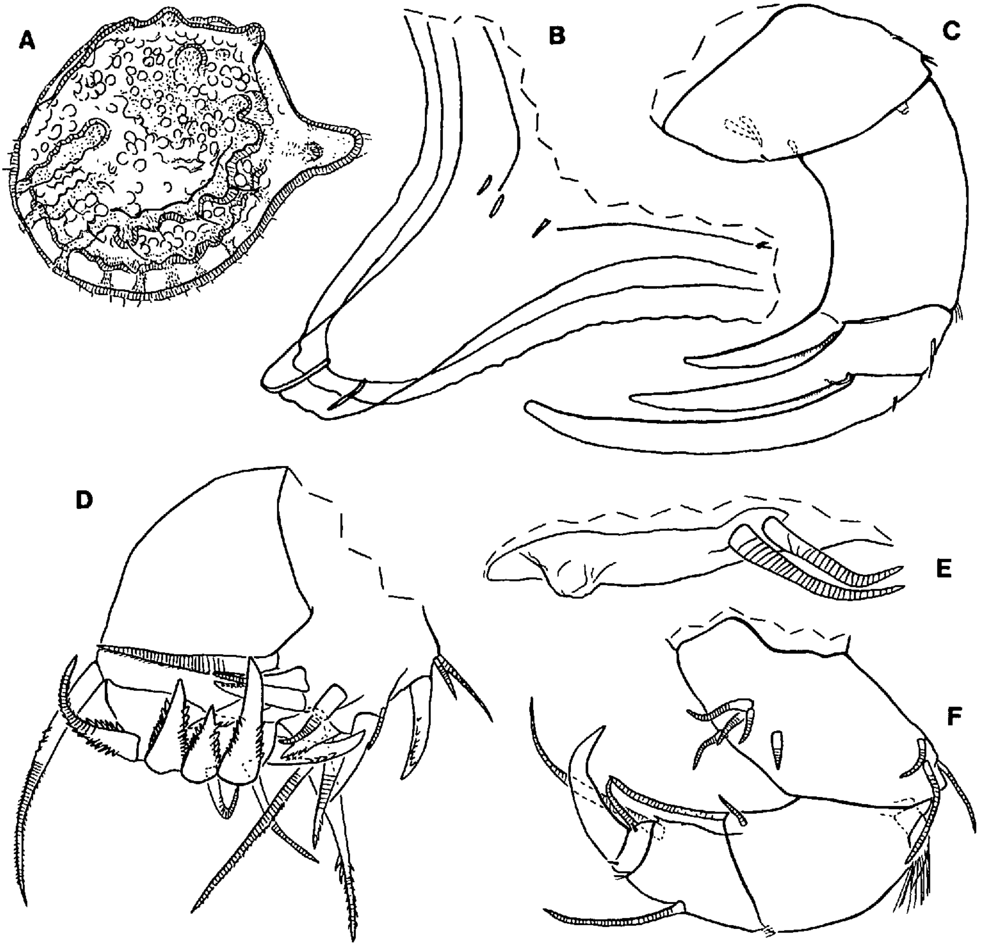

Figure 2. *Eusarsiella donabbotti.* Adult female holotype, (ac-cbc-610-C-A), L 1.25 mm: A. Left valve, not all fossae and spines shown. Adult female, (ac-cbc-111-A), L 1.23 mm: B. Left caudal infold; C. Right mandible, lateral view; D. Left fourth limb, medial view. Adult male, (ac-cbc-20-A), L 1.05 mm: E. Endopod of second antenna; F. Left mandible, medial view.

and beta-bristle; second joint with two a- and one c-bristles, and five stout pectinate end claws (three with basal 0.75 pectinate, one with basal half pectinate, one entirely pectinate with distal rings).

Fifth Limb. Endite with one bristle; fused endites II and III with two bristles; fused exopodial joints with total of nine bristles.

Sixth Limb. Endite with two short and two medium-short bristles. End joint with 12 stout spinous (possibly pectinate) ventral bristles and two longer hirsute posterior bristles.

Seventh Limb. One to two distal bristles (with three to four bells) and six terminal bristles (with three to five bells). End teeth: Two opposing rows of about three teeth each.

Furca. Each lamella with five rather straight claws (first claw united to lamella), followed posteriorly by three spines; second claw more than half length of first claw; claws one to four with posterior teeth.

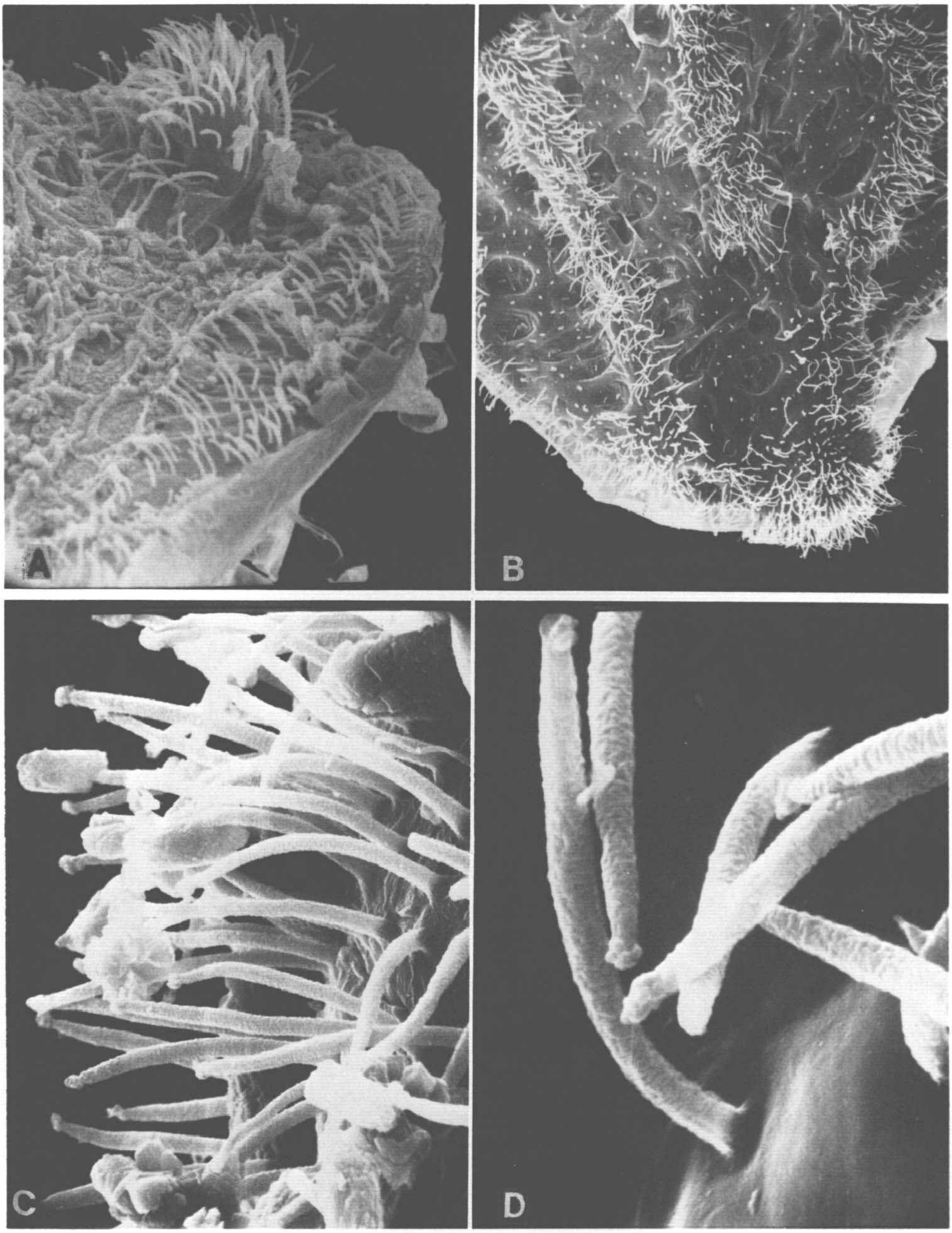

Figure 3. *Eusarsiella donabbotti.* Adult female, (ac-cbc-111-A), L 1.23 mm, left valve, external view: A. Caudal process, ×220. Adult male, (ac-cbc-602-F), L 1.01 mm, left valve, external view: B. Rostral area, ×300. Adult female, (ac-cbc-602-G). C. Spines or papillae on posterodorsal knob-like process, from Figure 1, ×3,200; D. Spines or papillae on caudal process, from Figure 1, ×11,000.

EYES. Lateral eye with five minute very pale gold ommatidia. Medial eye without pigment.

EGGS. Maximum embryo size given in millimeters in parentheses. ac-cbc-111-A, ac-cbc-610B-D (0.23), ac-cbc-604B-D (0.26), ac-cbc-604B-E (0.23), ac-cbc-604A-E, ac-cbc-514III-D each with four embryos in marsupium; ac-cbc-604A-

D (0.23) with five embryos in marsupium; ac-cbc-610B-E (0.26) with two embryos in marsupium; ac-cbc-375III-A (0.23) with three embryos in marsupium.

Description of Adult Male—[Similar to female unless noted here and in diagnosis.]

CARAPACE (Figs. 4A, 5). Four horizontal ribs slightly connected anteriorly and posteriorly (dorsal rib longest, subdorsal rib shortest); ribs, valve margin and surface (Figs. 5–7) with ornamentation similar to that of female except two largest processes located on posterior end of dorsal rib and posterodorsal corner of valve (Figs. 5, 6C, 7B), additional anterior process on rostrum.

INFOLD. Posteroventral infold with two minute bristles. Caudal infold (Figs. 4C, D) with row of two to three bristles plus zero to one bristle anterior to row. Posterior infold with zero to one minute bristle and two longer more dorsal setose bristles.

FIRST ANTENNA. Similar to adult female except fused third and fourth joints shorter and small fifth joint inserted on distal ventral margin; third joint with one medium-length dorsal and one minute ventral bristle; sensory bristle of fifth joint with broad fan-shaped base bearing numerous long slender filaments, slender tapered more distal stem with four shorter filaments. Seventh joint: a-bristle longer, about same length as b-bristle, longer c-bristle with three filaments. Eighth joint: g-bristle with four filaments. Filaments on c-, f-, and g-bristles slightly longer than in female.

SECOND ANTENNA (Fig. 2E). Exopod: Hirsute bristles of joints seven to eight sometimes with stout proximal spines.

MANDIBLE (Fig. 2F). Coxa: Endite minute, unringed, with branched tip. Basis: Two short and one medium ringed proximal ventral medial bristles, one distal short ringed ventral medial bristle, one medium-short ringed bristle near middle of ventral margin; one short ringed distal dorsal bristle, two medium-long subterminal ringed dorsal bristles. Exopod: Hirsute, tip reaching to 0.25–0.33 length of first endopodial joint. Endopod: First joint with one long ringed terminal ventral bristle (greater than or equal to length of claw on third joint and about 0.75 length of ventral bristle on second joint); one short ringed subterminal ventral medial bristle, minute dorsal terminal spines. Second joint with one long ringed distal lateral ventral bristle; one minute unringed terminal ventral spine; one long ringed bristle near middle of dorsal margin. Third joint with long curved stout bare claw (only 0.75 length of ventral bristle on second joint); one dorsal minute medial unringed bristle, one ventral minute ringed medial bristle.

FOURTH LIMB. Very reduced with weak bristles. Coxa with one dorsal bristle. Endites with at least eight bristles. Endopod with about five bristles.

FIFTH LIMB. Epipod with 34 bristles. Rest of limb with weak bristles (same number as female).

SIXTH LIMB. Endite: Three short bristles. End joint with 12 ventral bristles (five spinous, some also hirsute proximally and seven hirsute only) and two hirsute posterior bristles (not as long as longest ventral bristles).

SEVENTH LIMB. Three to five terminal bristles with four to five bells. End of limb smooth, without teeth.

FURCA. Each lamella with five slightly curved claws, with posterior teeth, followed posteriorly by three spines.

EYES. Lateral eye with seven pale gold ommatidia.

COPULATORY ORGAN. Short stout pointed claw with basal tooth bearing five rows of basal teeth.

Etymology.—The species is named in honor of Donald P. Abbott, for his outstanding contributions to education and progress in invertebrate zoology, and in gratitude for launching me on my career and encouraging me to persevere in it.

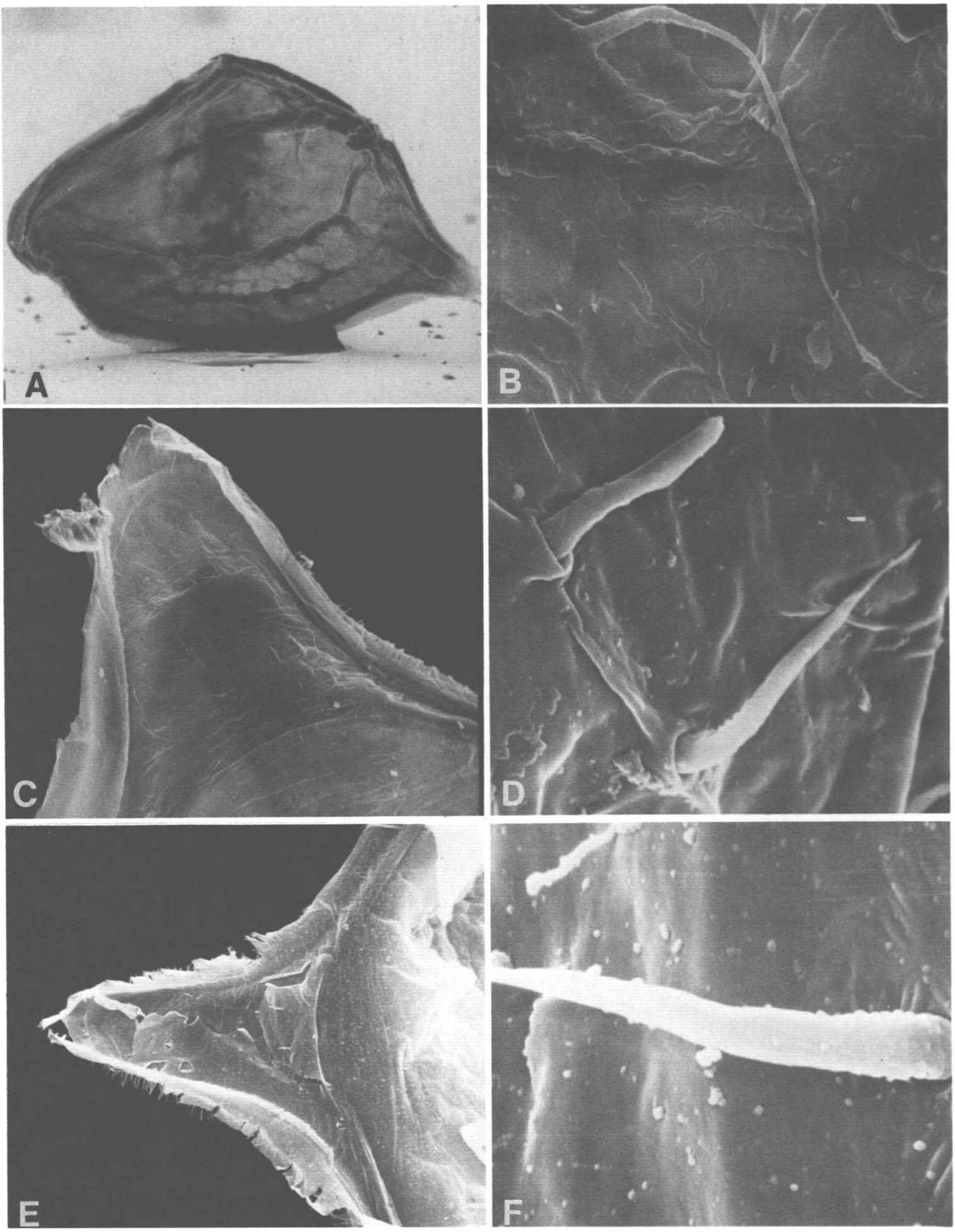

Figure 4. *Eusarsiella donabbotti.* Adult male, (ac-cbc-20-A), L 1.05 mm, left valve, external views, not all gelatinous covering removed: A. Whole valve, ×100; B. Bristle on posterior middle rib, ×1,200. Internal views: C. Caudal infold, ×400; D. Bristles on caudal infold, from C, ×4,000. Adult female, (ac-cbc-111), L 1.23 mm, internal views: E. Caudal infold, ×200; F. Bristle on caudal infold, from E, ×6,000.

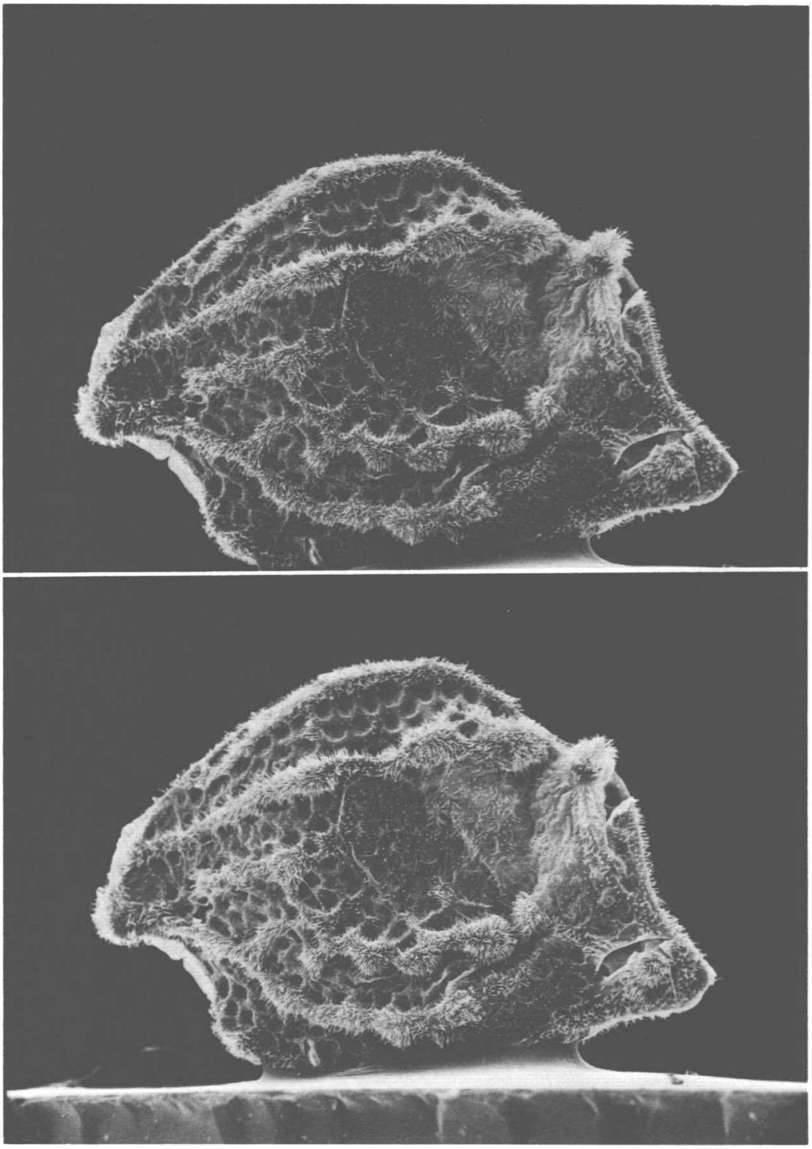

Figure 5. *Eusarsiella donabbotti*. Adult male, (ac-cbc-602-F), L 1.01 mm, left valve, external view: A. Whole valve, stereo pair, ×90.

Distribution.—Caribbean Sea: Benthic sand samples from reef in vicinity of Carrie Bow Cay, Belize, depth 1.5–30 m.

DISCUSSION

Eusarsiella donabbotti has the diagnostic characters of the genus *Eusarsiella*, but is only provisionally assigned to that genus because *Eusarsiella* is in need of revision. *Eusarsiella* is presently defined on the basis of a unique combination of

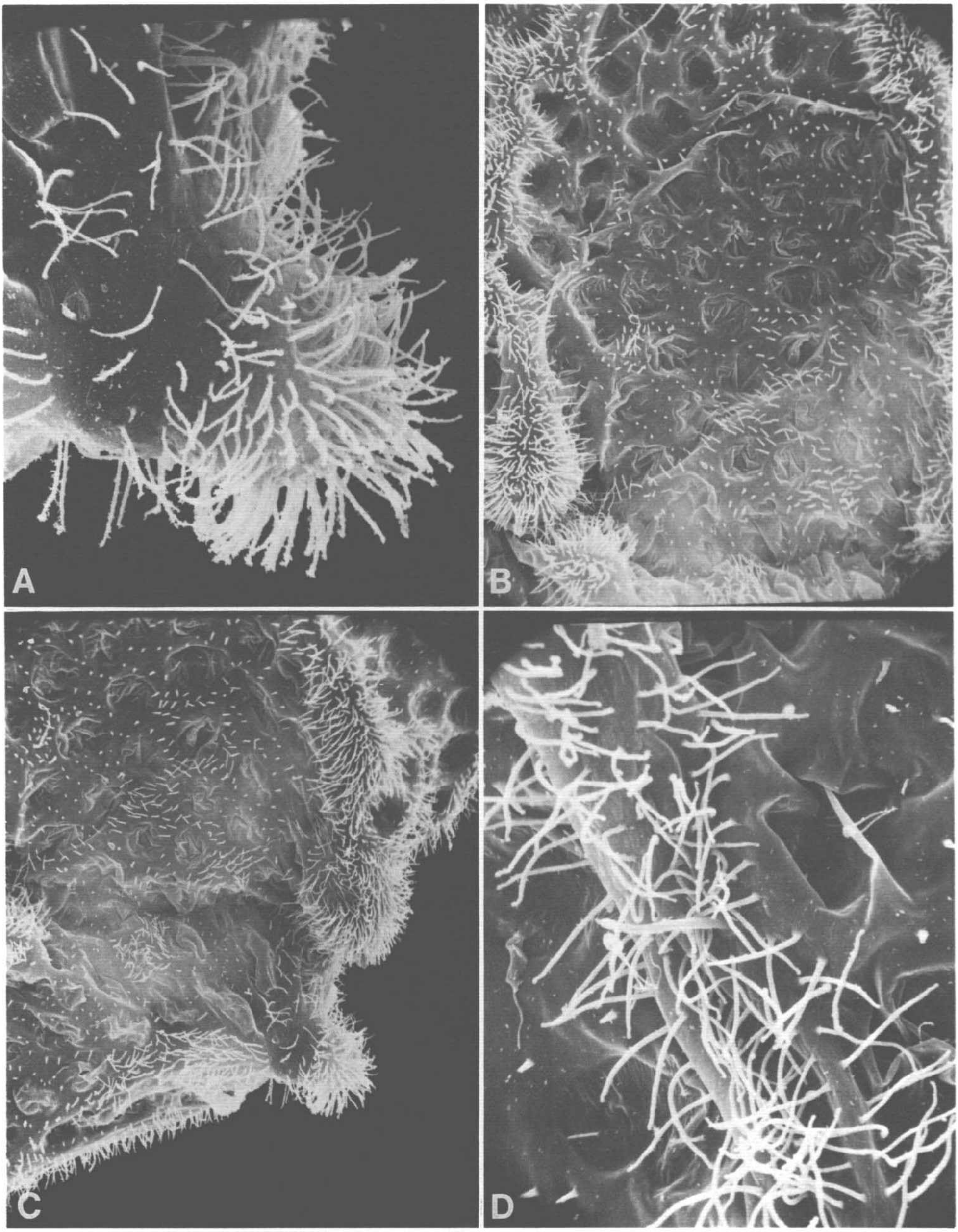

Figure 6. *Eusarsiella donabbotti*. Adult male, (ac-cbc-602-F), L 1.01 mm, left valve, external views: A. Posterodorsal knob-like process from C, ×900; B. Central area, ×270; C. Posterodorsal area, ×245; D. Ridge on rostrum, from Fig. 3B, ×1,200.

characters (Kornicker, 1986; Cohen 1987), but lacks a uniquely defining character (synapomorphy); about 50 species are assigned to it. *Eusarsiella donabbotti* differs from similar Belize species of *Eusarsiella* in having the following unique characters: valve with two curved spinous ventral ribs (the inner rib stronger and

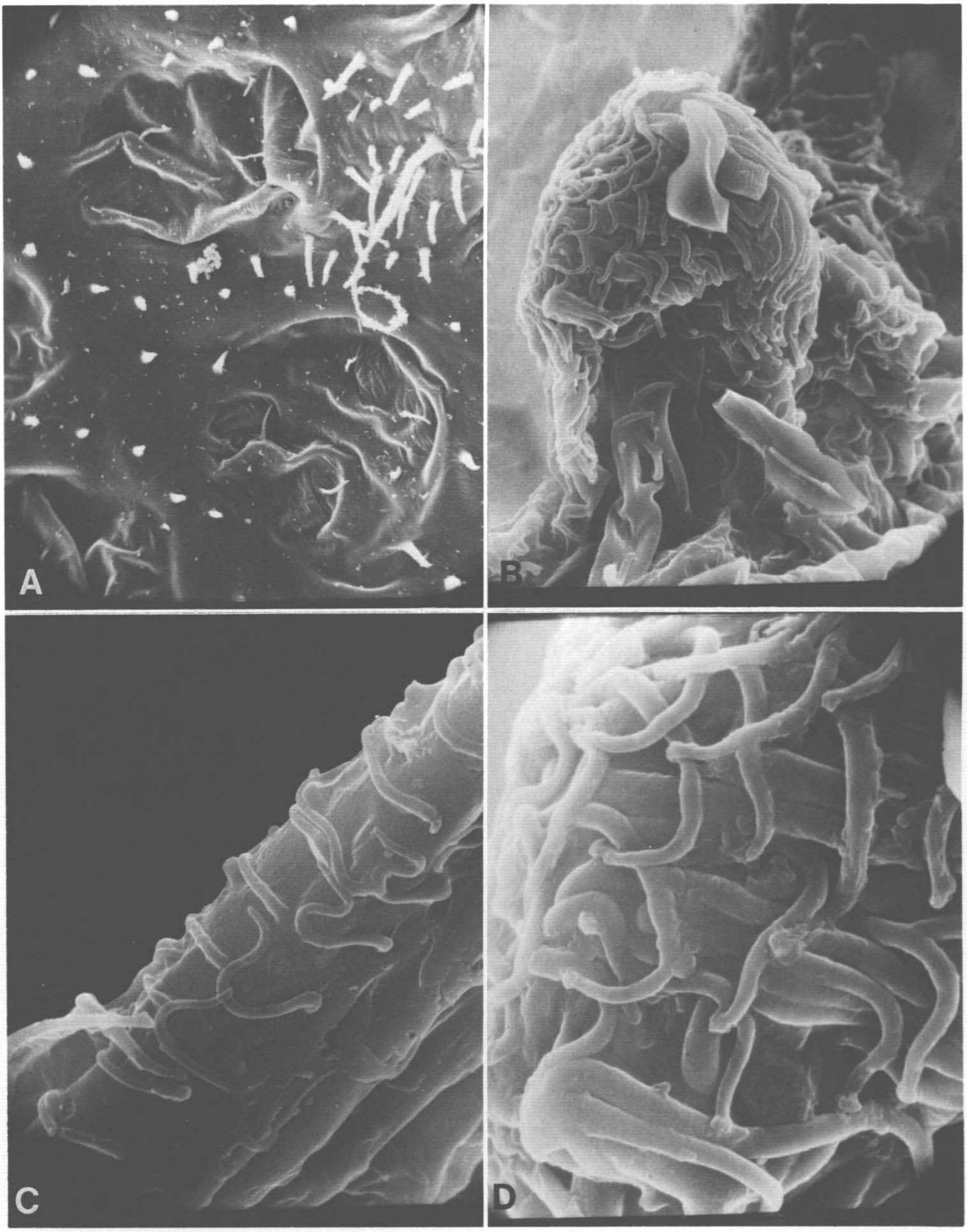

Figure 7. *Eusarsiella donabbotti*. Adult male, (ac-cbc-602-F), L 1.01 mm, left valve, external view: A. Central area, from Figure 6B, ×1,200. (ac-cbc-20-A), L 1.05 mm, left valve, external views, not all gelatinous covering removed: B. Posterodorsal knob-like process, from Figure 4A, ×1,500; C. Marginal rib, ×2,500; D. Detail of spines or papillae on knob-like process, from B, ×5,000.

having six low rounded knob-like processes), a very spinous central posterodorsal area (at least four rows of spines between fossae) with a rounded knob-like process, and two to three short horizontal ribs connected to anterior margin. *E. donabbotti* is further distinguished by the following unique combination of characters: large size (female L = 1.23–1.35 mm, male L = 1.01–1.05 mm); valve with abundant spines (or papillae), anterior and ventral margins bearing a wide fringe of papillae or spines that are half the length of bristles on the margin; fourth joint of first antenna with two ventral bristles; endopodite of male second antenna not reflexed and with only one joint plus a bare mound; male mandible with only one claw (terminal), claw short and bent; fourth limb with only two exopodial bristles and female with one end claw much longer than the rest; female seventh limb with six and male with three to five terminal bristles. I have examined the valves of the holotype (USNM 107845), and also a male (USNM 158071) identified by Kornicker (1986) as *E. spinosa* (Kornicker and Wise, 1962). That species is very similar to *E. donabbotti* in valve shape and ornamentation and in having a fourth limb with one end claw much longer than the rest. *Eusarsiella donabbotti* differs from *E. spinosa* in the valve characters listed above and in the following characters: (1) males of *E. donabbotti* have a long seventh limb bearing three to five bristles, not a minute bare seventh limb; (2) males of *E. donabbotti* have a second antenna with a 1-jointed (plus minute bare mound) endopod, not a two-jointed endopod with a bristle on the second joint; (3) *E. donabbotti* has a fifth limb with nine, not five to six, bristles on joints two to five of the exopod; (4) *E. donabbotti* has on the knob-like process on the valves, bristles (or papillae) which are finger-like in shape with enlarged rounded tips, not pointed tips; (5) in female *E. donabbotti* the longest end claw of the fourth limb is about twice the length of the adjacent middle claw, not 1.7 times the length as in *E. spinosa*; and (6) the caudal process is a little more elongate and the posterodorsal knob-like processes extend beyond the posterodorsal margin in *E. donabbotti,* but not *E. spinosa.* I have examined type material of *E. pilipollicis* (Darby, 1965) (Kornicker, 1986); *E. donabbotti* differs from that species in having stout spines as well as hairs on the bristles of exopodial joints two to eight of the second antenna.

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